

TABLE OF CONTENTS

CHAPTER 1	PROPOSED PROJECT	1-1
1.1	Introduction	1-1
1.1.1	Existing Facility	1-7
1.1.2	Project Background/History.....	1-9
1.1.3	Related Project	1-10
1.2	Purpose and Need.....	1-11
1.2.1	Purpose of the Proposed Project	1-11
1.2.2	Need for the Proposed Project	1-11
1.3	Independent Utility and Logical Termini.....	1-36
1.3.1	Logical Termini.....	1-37
1.3.2	Independent Utility	1-37
CHAPTER 2	PROJECT ALTERNATIVES	2-1
2.1	Project Description.....	2-1
2.2	Project Alternatives.....	2-2
2.2.1	Build Alternative (Two-Lane Tolled Express Lanes Connector): Identification of a Preferred Alternative	2-3
2.2.2	No Build (No Action) Alternative.....	2-27
2.3	Anticipated Project Schedule	2-28
2.4	Construction Staging.....	2-28
2.5	Estimated Cost	2-29
2.6	Comparison of Alternatives	2-29
2.7	Value Analysis	2-41
2.8	Alternatives Considered But Eliminated From Further Discussion.....	2-42
2.8.1	Preliminary Studies	2-42
2.8.2	Transportation System Management (TSM) and Transportation Demand Management (TDM) Alternatives	2-45
2.9	Permits and Approvals Needed.....	2-46
CHAPTER 3	AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES.....	3-1
	<i>HUMAN ENVIRONMENT.....</i>	<i>3.1-1</i>
3.1	Land Use	3.1-1
3.1.1	Existing and Future Land Uses	3.1-1
3.1.2	Consistency with Federal, State, Regional, and Local Plans	3.1-20
3.1.3	Parks and Recreational Facilities	3.1-35
3.2	Growth	3.2-1
3.2.1	Regulatory Setting.....	3.2-1
3.2.2	Affected Environment.....	3.2-1
3.2.3	Environmental Consequences	3.2-10
3.2.4	Avoidance, Minimization, and/or Mitigation Measures	3.2-13
3.3	Community Impacts	3.3-1
3.3.1	Community Character and Cohesion	3.3-1
3.3.2	Relocations and Real Property Acquisitions.....	3.3-21
3.3.3	Environmental Justice	3.3-22
3.4	Utilities/Emergency Services	3.4-1
3.4.1	Affected Environment.....	3.4-1
3.4.2	Environmental Consequences	3.4-4

3.4.3	Avoidance, Minimization, and/or Mitigation Measures	3.4-7
3.5	Traffic and Transportation/Pedestrian and Bicycle Facilities.....	3.5-1
3.5.1	Regulatory Setting	3.5-1
3.5.2	Affected Environment	3.5-1
3.5.3	Environmental Consequences.....	3.5-5
3.5.4	Avoidance, Minimization, and/or Mitigation Measures	3.5-36
3.6	Visual/Aesthetics	3.6-1
3.6.1	Regulatory Setting	3.6-1
3.6.2	Methodology.....	3.6-1
3.6.3	Affected Environment	3.6-4
3.6.4	Environmental Consequences.....	3.6-8
3.6.5	Avoidance, Minimization, and/or Mitigation Measures	3.6-17
3.7	Cultural Resources.....	3.7-1
3.7.1	Regulatory Setting	3.7-1
3.7.2	Affected Environment	3.7-2
3.7.3	Environmental Consequences.....	3.7-6
3.7.4	Avoidance, Minimization, and/or Mitigation Measures	3.7-8
	PHYSICAL ENVIRONMENT.....	3.8-1
3.8	Water Quality and Storm Water Runoff.....	3.8-1
3.8.1	Regulatory Setting	3.8-1
3.8.2	Affected Environment	3.8-6
3.8.3	Environmental Consequences.....	3.8-13
3.8.4	Avoidance, Minimization, and/or Mitigation Measures	3.8-18
3.9	Geology/Soils/Seismic/Topography	3.9-1
3.9.1	Regulatory Setting	3.9-1
3.9.2	Affected Environment	3.9-1
3.9.3	Environmental Consequences.....	3.9-12
3.9.4	Avoidance, Minimization, and/or Mitigation Measures	3.9-15
3.10	Paleontology	3.10-1
3.10.1	Regulatory Setting	3.10-1
3.10.2	Affected Environment	3.10-1
3.10.3	Environmental Consequences.....	3.10-13
3.10.4	Avoidance, Minimization, and/or Mitigation Measures	3.10-14
3.11	Hazardous Waste/Materials.....	3.11-1
3.11.1	Regulatory Setting	3.11-1
3.11.2	Affected Environment	3.11-2
3.11.3	Environmental Consequences.....	3.11-3
3.11.4	Avoidance, Minimization, and/or Mitigation Measures	3.11-16
3.12	Air Quality.....	3.12-1
3.12.1	Regulatory Setting	3.12-1
3.12.2	Affected Environment	3.12-3
3.12.3	Environmental Consequences.....	3.12-14
3.12.4	Avoidance, Minimization, and/or Mitigation Measures	3.12-32
3.13	Noise.....	3.13-1
3.13.1	Regulatory Setting	3.13-1
3.13.2	Affected Environment	3.13-4
3.13.3	Environmental Consequences.....	3.13-16
3.13.4	Avoidance, Minimization, and/or Mitigation Measures	3.13-25
3.14	Energy.....	3.14-1
3.14.1	Regulatory Setting	3.14-1
3.14.2	Affected Environment	3.14-1

3.14.3	Environmental Consequences	3.14-12
3.14.4	Total Energy Impacts	3.14-19
3.14.5	Avoidance, Minimization, and/or Mitigation Measures	3.14-20
3.14.6	Consistency with Energy Conservation Plans.....	3.14-20
3.15	Natural Communities	3.15-1
3.15.1	Regulatory Setting.....	3.15-1
3.15.2	Affected Environment.....	3.15-1
3.15.3	Environmental Consequences	3.15-35
3.15.4	Avoidance, Minimization, and/or Mitigation Measures	3.15-58
BIOLOGICAL ENVIRONMENT.....		3.16-1
3.16	Wetlands and Other Waters	3.16-1
3.16.1	Regulatory Setting.....	3.16-1
3.16.2	Affected Environment.....	3.16-3
3.16.3	Environmental Consequences	3.16-10
3.16.4	Avoidance, Minimization, and/or Mitigation Measures	3.16-15
3.17	Plant Species	3.17-1
3.17.1	Regulatory Setting.....	3.17-1
3.17.2	Affected Environment.....	3.17-1
3.17.3	Environmental Consequences	3.17-5
3.17.4	Avoidance, Minimization, and/or Mitigation Measures	3.17-7
3.18	Animal Species	3.18-1
3.18.1	Regulatory Setting.....	3.18-1
3.18.2	Affected Environment.....	3.18-2
3.18.3	Environmental Consequences	3.18-7
3.18.4	Avoidance, Minimization, and/or Mitigation Measures	3.18-12
3.19	Threatened and Endangered Species.....	3.19-1
3.19.1	Regulatory Setting.....	3.19-1
3.19.2	Affected Environment.....	3.19-2
3.19.3	Environmental Consequences	3.19-10
3.19.4	Preliminary Effects Determination	3.19-19
3.19.5	Avoidance, Minimization, and/or Mitigation Measures	3.19-21
3.20	Invasive Species.....	3.20-1
3.20.1	Regulatory Setting.....	3.20-1
3.20.2	Affected Environment.....	3.20-1
3.20.3	Environmental Consequences	3.20-2
3.20.4	Avoidance, Minimization, and/or Mitigation Measures	3.20-3
3.21	Relationship between Local Short-term Uses of the Human Environment and the Maintenance of Long-Term Productivity	3.21-1
3.21.1	Build Alternative (Two-Lane Express Lanes Connector) (Preferred Alternative)	3.21-1
3.21.2	No Build Alternative	3.21-3
3.21.3	Comparative Analysis	3.21-3
3.22	Irreversible and Irretrievable Commitments of Resources That Would Be Involved in the Proposed Action	3.22-1
3.22.1	Build Alternative (Two-Lane Express Lanes Connector) (Preferred Alternative)	3.22-1
3.22.2	No Build Alternative	3.22-2
3.23	Cumulative Impacts	3.23-1
3.23.1	Regulatory Setting.....	3.23-1
3.23.2	Methodology	3.23-1
3.23.3	Identification of Cumulative Projects	3.23-2

Table of Contents

3.23.4	Identification of the Resources Considered in the Cumulative Impact Analysis	3.23-3
3.23.5	Cumulative Impact Analysis	3.23-10
3.23.6	Avoidance, Minimization, and/or Mitigation Measures.....	3.23-16
CHAPTER 4	CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) EVALUATION.....	4-1
4.1	Determining Significance under CEQA	4-1
4.2	Effects of the Proposed Project.....	4-2
4.2.1	No Effects	4-4
4.2.2	Less Than Significant Effects of the Proposed Project	4-17
4.2.3	Significant Effects of the Proposed Project.....	4-49
4.2.4	Unavoidable Significant Environmental Effects of the Proposed Project.....	4-58
4.2.5	Significant Irreversible Environmental Changes.....	4-58
4.3	Climate Change	4-59
4.3.1	Regulatory Setting	4-60
4.3.2	Project Analysis.....	4-63
4.4	Mitigation Measures for Significant Impacts Under CEQA	4-74
CHAPTER 5	COMMENTS AND COORDINATION	5-1
5.1	Introduction	5-1
5.2	Scoping Process.....	5-1
5.2.1	Notice of Preparation, Notice of Intent, Public Notice.....	5-1
5.2.2	Comments Received During Scoping.....	5-2
5.3	Consultation and Coordination with Agencies	5-6
5.3.1	Consultation and Coordination with Cooperating and Participating Agencies.....	5-6
5.3.2	Biological Resources Consultation.....	5-16
5.3.3	Native American Consultation and Coordination.....	5-18
5.3.4	Section 4(f) Consultation.....	5-19
5.3.5	SHPO Consultation	5-20
5.3.6	Interagency Coordination Regarding Air Quality (Transportation Conformity Working Group)	5-21
5.4	Project Team Coordination.....	5-21
5.4.1	Project Development Team	5-21
5.4.2	Value Analysis Workshops	5-21
CHAPTER 6	LIST OF PREPARERS.....	6-1
6.1	Lead Agency	6-1
6.1.1	California Department of Transportation, District 12	6-1
6.2	Project Sponsor Agency	6-4
6.2.1	Foothill/Eastern Transportation Corridor Agency.....	6-4
6.3	Consultants to the Lead Agency	6-5
6.3.1	LSA Associates, Inc.	6-5
6.3.2	Michael Baker International	6-9
6.3.3	CH2M Hill.....	6-10
6.3.4	CDMG	6-10
CHAPTER 7	DISTRIBUTION LIST	7-1
APPENDIX A	CEQA ENVIRONMENTAL CHECKLIST	A-1

APPENDIX B	RESOURCES EVALUATED RELATIVE TO REQUIREMENTS OF SECTION 4(F) AND PRELIMINARY DE MINIMIS DETERMINATION.....	B-1
APPENDIX C	TITLE VI POLICY STATEMENT.....	C-1
APPENDIX D	AVOIDANCE, MINIMIZATION, AND/OR MITIGATION SUMMARY	D-1
APPENDIX E	2012 RTP, 2015 FTIP, AND 2016 RTP/SCS PROJECT LISTINGS	E-1
APPENDIX F	LIST OF ACRONYMS AND ABBREVIATIONS	F-1
APPENDIX G	LIST OF TECHNICAL STUDIES.....	G-1
APPENDIX H	USFWS SPECIES LIST	H-1
APPENDIX I	TRAFFIC MANAGEMENT PLAN DATA SHEET	I-1

This page intentionally left blank

LIST OF FIGURES

Figure 1.1 Project Vicinity.....	1-3
Figure 1.2 Project Location.....	1-5
Figure 1.3 LOS Thresholds for a Basic Freeway Segment.....	1-13
Figure 1.4 County Population Growth Patterns – 1970 to 2040.....	1-16
Figure 1.5 City Population Growth Patterns – 1970 to 2040.....	1-16
Figure 1.6 Existing (2013) Traffic Data Map Locations	1-21
Figure 2.1 Build Alternative	2-5
Figure 3.1.1 Existing Land Use	3.1-3
Figure 3.1.2 General Plan Land Use	3.1-7
Figure 3.1.3 Planned Projects	3.1-17
Figure 3.1.4 Parks and Recreational Resources and Properties	3.1-41
Figure 3.1.5 Use of Land in Gypsum Canyon Nature Preserve.....	3.1-49
Figure 3.2.1 County Population Growth Patterns – 1970 to 2040	3.2-2
Figure 3.2.2 City Population Growth Patterns – 1970 to 2040.....	3.2-3
Figure 3.3.1 Community Impact Study Area and Census Tracts.....	3.3-3
Figure 3.3.2 Community Facilities/Activity Centers	3.3-13
Figure 3.6.1 Aerial View of Proposed Express Lanes Connector Structure	3.6-11
Figure 3.6.2 Long-Duration View of Proposed Express Lanes Connector Structure	3.6-15
Figure 3.9.1 Geologic Map	3.9-3
Figure 3.9.2 Seismic Hazards Map	3.9-7
Figure 3.10.1 Geologic Map of the Project Area and Vicinity	3.10-5
Figure 3.10.2 Paleontological Sensitivity Map.....	3.10-7
Figure 3.10.3 Geology Map	3.10-9
Figure 3.11.1 Overview Map	3.11-13
Figure 3.12.1 Air Quality Monitoring Stations.....	3.12-7
Figure 3.13.1 Common Noise Environments (CNEs)	3.13-5
Figure 3.13.2 Receptors within CNE 1-3.....	3.13-7
Figure 3.13.3 Receptors within CNE 2-3.....	3.13-11
Figure 3.13.4 Receptors within CNE 3-3.....	3.13-13
Figure 3.14.1 Alternative Fueled Vehicles in Use in the United States between 1995 and 2011	3.14-11
Figure 3.14.2 Estimated Consumption of Alternative Fuel by Alternative Fuel Vehicles in the United States between 1995 and 2011.....	3.14-12
Figure 3.15.1 Biological Resources	3.15-3
Figure 3.15.2 Project Impacts to Biological Resources	3.15-37
Figure 4.1 California Greenhouse Gas Forecast	4-64
Figure 4.2 Possible Effect of Traffic Operation Strategies in Reducing On-Road CO ₂ Emission	4-65
Figure 4.3 Mobility Pyramid.....	4-68

This page intentionally left blank

LIST OF TABLES

Table 1.1 Total Demand for Existing (2013), Opening (2017 data), and Design (2040) Years.....	1-19
Table 1.2 Existing (2013) AM and PM Peak Hour Travel Speed and Travel Times	1-20
Table 1.3 Existing (2013) Peak Period Vehicle Throughput Comparison.....	1-26
Table 1.4 Opening Year (2017) No Build Peak Period Vehicle Throughput Comparison	1-27
Table 1.5 Design Year (2040) No Build Peak Period Vehicle Throughput Comparison	1-28
Table 1.6 General Plan Land Use	1-35
Table 2.1 Design Exception Terms.....	2-24
Table 2.2 Comparison of Impacts for the Project Alternatives.....	2-30
Table 2.3 Permits and Approvals Needed.....	2-47
Table 3.1.1 Existing Land Use.....	3.1-5
Table 3.1.2 General Plan Land Use	3.1-9
Table 3.1.3 Planned Projects.....	3.1-10
Table 3.1.4 Consistency with SCAG's 2012 RTP/SCS.....	3.1-30
Table 3.1.5 Consistency with Local General Plans	3.1-31
Table 3.1.6 Parks and Recreational Resources and Properties	3.1-36
Table 3.2.1 Job Growth from 2012 to 2040.....	3.2-8
Table 3.2.2 Household Growth from 2012 to 2040	3.2-9
Table 3.3.1 Community Cohesion Indicators	3.3-10
Table 3.3.2 Employment Status	3.3-12
Table 3.3.3 Income and Poverty Level	3.3-15
Table 3.3.4 Commuting Patterns	3.3-17
Table 3.3.5 Minority, Hispanic, and Low-Income Populations for the Study Area	3.3-24
Table 3.4.1 Police/Sheriff Service Areas in the Vicinity of the Project Limits	3.4-2
Table 3.4.2 Local Fire Stations in the Vicinity of the Project Limits	3.4-3
Table 3.4.3 Hospitals and Medical Facilities in the Vicinity of the Project Limits	3.4-3
Table 3.4.4 Potential Utility Relocations and Protection In Place under the Build Alternative.....	3.4-4
Table 3.5.1 Existing (2013) Peak Period Vehicle Throughput Comparison.....	3.5-3
Table 3.5.2 Existing (2013) AM and PM Peak Hour Travel Speeds and Travel Times....	3.5-4
Table 3.5.3 2017 Data Vehicle Throughput Comparison	3.5-7
Table 3.5.4 2040 Vehicle Throughput Comparison.....	3.5-11
Table 3.5.5 Travel Time Comparisons - No Build and Build Alternatives in 2017 Data, AM Peak Period (6:00 AM to 9:00 AM).....	3.5-17
Table 3.5.6 Travel Time Comparisons - No Build and Build Alternatives in 2017 Data, PM Peak Period (3:00 PM to 7:00 PM).....	3.5-21
Table 3.5.7 Travel Time Comparisons - No Build and Build Alternatives in 2040, AM Peak Period (6:00 AM to 9:00 AM)	3.5-22
Table 3.5.8 Travel Time Comparisons - No Build and Build Alternatives in 2040, PM Peak Period (3:00 PM to 7:00 PM)	3.5-23
Table 3.5.9 Summary of 2017 Data Express Lane Operations	3.5-27
Table 3.5.10 Summary of 2040 Express Lane Operations.....	3.5-28
Table 3.5.11 2017 Data Summary of Network Performance for the No Build and Build Alternatives	3.5-29
Table 3.5.12 2040 Summary of Network Performance for the No Build and Build Alternatives	3.5-31

Table 3.5.13 Opening Year (2017 data) No Build Alternative Peak Period Vehicle Throughput Comparison	3.5-34
Table 3.5.14 Design Year (2040) No Build Alternative Peak Period Vehicle Throughput Comparison	3.5-35
Table 3.5.15 Opening Year (2017 data) No Build Alternative Travel Times	3.5-37
Table 3.5.16 Design Year (2040) No Build Alternative Travel Times	3.5-38
Table 3.8.1 Surface Water Quality Objectives for Inland Surface Waters.....	3.8-9
Table 3.8.2 Groundwater Quality Objectives for Groundwater Basins in the Santa Ana Region	3.8-12
Table 3.10.1 Geologic Time Periods and Geologic Units in the Area of Project Disturbance	3.10-4
Table 3.10.2 Geologic Units and Paleontological Sensitivity ¹ in the Area of Project Disturbance	3.10-11
Table 3.11.1 Database Summaries	3.11-4
Table 3.11.2 Hazardous Materials in the Project Area and Project Vicinity.....	3.11-6
Table 3.12.1 Local Air Quality Levels	3.12-9
Table 3.12.2 State and Federal Criteria Air Pollutant Standards, Effects, and Sources ..	3.12-10
Table 3.12.3 Sensitive Land Uses in the Project Area	3.12-14
Table 3.12.4 2017 data ¹ Traffic Volumes.....	3.12-19
Table 3.12.5 2040 Traffic Volumes	3.12-19
Table 3.12.6 2017 Level of Service.....	3.12-20
Table 3.12.7 2040 Level of Service.....	3.12-20
Table 3.12.8 Maximum Build Alternative Construction Emissions (lbs/day)	3.12-23
Table 3.12.9 Systemwide Project-related Motor Vehicle Emissions	3.12-25
Table 3.13.1 Noise Abatement Criteria.....	3.13-2
Table 3.13.2 Noise Levels of Common Activities	3.13-3
Table 3.13.3 Summary of Short-Term Measurements	3.13-15
Table 3.13.4 Comparison of Measured to Predicted Sound Levels in the TNM Model.....	3.13-15
Table 3.13.5 No Build Noise Levels (2017 data ¹).....	3.13-17
Table 3.13.6 Construction Equipment Noise.....	3.13-19
Table 3.13.7 2040 Noise Levels for CNE 1-3 (west side of SR-241 [Summit at Anaheim Hills])	3.13-20
Table 3.13.8 2040 Noise Levels and Barrier Analysis for CNE 2-3 (north side of SR-91 at Gypsum Canyon Road) Noise Barrier on Express Lanes	3.13-21
Table 3.13.9 2040 Noise Levels for CNE 3-3 (north side of SR-91 [Archstone at Yorba Linda and Sycamore Park])	3.13-23
Table 3.13.10 Sound Barrier Analysis at CNE 2-3 (north side of SR-91 at Gypsum Canyon Road) Noise Barrier on Express Lanes	3.13-27
Table 3.13.11 Sound Barrier Analysis at CNE 2-3 (north side of SR-91 at Gypsum Canyon Road) Noise Barrier along SR-91 (above existing).....	3.13-31
Table 3.13.12 Average Noise Levels at CNE 2-3 Receptors (dBA)	3.13-33
Table 3.14.1 Annual Electric Consumption in Orange County in 2013.....	3.14-7
Table 3.14.2 Natural Gas Consumption in Orange County in 2013.....	3.14-8
Table 3.14.3 Study Area Temporary Indirect Energy Impacts.....	3.14-15
Table 3.14.4 Operational Annual Vehicle Miles Traveled in the Study Area.....	3.14-16
Table 3.14.5 Study Area Direct Energy Consumption – Annual	3.14-17
Table 3.14.6 Study Area Permanent Indirect Energy Impacts	3.14-19
Table 3.14.7 Study Area Energy Consumption Summary	3.14-20
Table 3.15.1 Plant Communities in the BSA.....	3.15-29

Table 3.15.2 Potential Impacts to Coastal Sage Scrub Vegetation in the NCCP/HCP and Non-NCCP/HCP Plan Areas by Roadway	3.15-36
Table 3.16.1 Potential USACE Jurisdictional Non-wetland Waters.....	3.16-5
Table 3.16.2 Potential CDFW Jurisdictional Areas.....	3.16-6
Table 3.16.3 Functions and Values of Drainages in the BSA.....	3.16-9
Table 3.16.4 Potential Temporary Impacts to USACE Jurisdictional Non-Wetland Waters	3.16-10
Table 3.16.5 Temporary Impacts to CDFW Jurisdictional Areas.....	3.16-12
Table 3.16.6 Permanent Impacts to USACE Jurisdictional Non-Wetland Waters	3.16-13
Table 3.16.7 Permanent Impacts to CDFW Jurisdictional Areas	3.16-14
Table 3.18.1 Potential Temporary Impacts to Coastal Sage Scrub and Chaparral Habitat Inside and Outside the NCCP Plan Area	3.18-8
Table 3.18.2 Potential Permanent Impacts to Coastal Sage Scrub and Chaparral Habitat Inside and Outside the NCCP Plan Area	3.18-10
Table 3.19.1 Potential Effects on Coastal California Gnatcatcher Occupied Habitat and Designated Critical Habitat Within and Outside the NCCP/HCP Plan Area ¹ .	3.19-13
Table 3.19.2 Preliminary Effects Determination for Federally Listed Species	3.19-20
Table 4.1 Regional GHG Emissions	4-66
Table 4.2 Climate Change/CO ₂ Reduction Strategies.....	4-70
Table 4.3 Mitigation Measures for Significant Impacts	4-74
Table 5.1 Comments Received During Scoping	5-3
Table 5.2 Coordination Plan Comments	5-9
Table B.1 Irvine Ranch National Natural Landmark.....	B-9

This page intentionally left blank